

REMARKS

This Amendment and Response to Final Office Action is being submitted in response to the final Office Action mailed June 1, 2005. Claims 1-22 are pending in the Application. Claims 1-22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Homme et al. (U.S. Patent No. 6,262,422).

In response to this rejection, Claims 1, 13, 18, and 19 have been amended to further clarify the subject matter which Applicant regards as the invention. These amendments are fully supported in the Specification, Drawings, and Claims of the Application and no new matter has been added. Based upon the amendments, reconsideration of the Application is respectfully requested in view of the following remarks.

Rejection of Claims 1-22 Under 35 U.S.C. 103(a) – Homme et al.:

Claims 1-22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Homme et al. (U.S. Patent No. 6,262,422).

The Application indicates that a single-layer transmissive and reflective barrier coating is disposed on the surface of the scintillator material of an x-ray detector. This scintillator material comprises a plurality of cesium iodide needles, for example. The Application also indicates that this single-layer transmissive and reflective barrier coating is “substantially conformal” and is disposed on the surface of the scintillator material “both on top of the needles and around the sides or edges of the needles.” Thus, the Application contemplates *a substantially conformal transmissive/reflective barrier coating disposed both on top of and around the sides or edges of the needles*. In other words, *the transmissive/reflective elements of the barrier coating are disposed both on top of and around the sides or edges of the needles*. This is significantly and patentably distinguishable from Homme et al.

Typically, multiple-layer transmissive, reflective, and barrier coatings are disposed adjacent to the tops of the needles only, *especially the reflective coating*. For example, Homme et al. disclose that the inorganic reflective/transmissive film (10 in Figure 2) is disposed adjacent to the tops of the needles only, with the first organic barrier film (9 in Figure 2) disposed therebetween. See Figs. 2, 7-11, and 13. Although, Homme et al. do disclose that the depicted three-layer (9, 10, 11 in Figure 2) construction for the barrier coating (12 in Figure 2) could consist of a single layer (see column 3, lines 12-14), only a single layer *organic* barrier coating is contemplated (again, see column 3, lines 12-14). *The inorganic reflective layer (10 in Figure 2) is still provided as a separate layer.* In other words, the single-layer reference in column 3, lines 12-14 of Homme et al. basically suggests omitting organic barrier layer 11 in Figure 2. This is evidenced at column 7, lines 30-32 (“when a material highly resistant to corrosion is used for the inorganic film 10, the second organic film 11 per se may be omitted”). *There is no teaching or suggestion by Homme et al. that the reflective element of the barrier coating, whether it is an inorganic reflective layer or a modified organic reflective layer, is disposed both on top of the needles and around the sides or edges of the needles.*

Advantageously, utilizing a single-layer transmissive and reflective barrier coating that is substantially conformal and that is disposed on the surface of the scintillator material both on top of the needles and around the sides or edges of the needles maximizes the reflection of light and improves overall imaging performance, resulting in sharper images. *This is due to the fact that the reflective element of the barrier coating, whether it is an inorganic reflective layer or a modified organic reflective layer, is disposed both on top of the needles and around the sides or edges of the needles.*

This point of novelty was made explicit in previously-amended Claims 1, 13, 18, and 19, which recited:

1. A scintillator comprising:

a scintillator material comprising a single-layer barrier coating disposed thereon, wherein the barrier coating: (1) provides barrier protection to the scintillator material, (2) is capable of transmitting light therethrough, and (3) *is capable of reflecting light back into the scintillator material, and wherein the barrier coating is disposed on top portions and interstitially on side portions of the scintillator material.*

13. A scintillator comprising a single-layer coating thereon that protects the scintillator from ambient conditions, transmits light therethrough, and *reflects light back into the scintillator, wherein the coating is disposed on top portions and interstitially on side portions of the scintillator.*

18. A radiation imaging system comprising:

an x-ray source;

an x-ray detector comprising:

a scintillator comprising:

a scintillator material comprising a single-layer barrier coating disposed thereon, wherein the barrier coating: (1) provides barrier protection to the scintillator material, (2) is capable of transmitting light therethrough, and (3) *is capable of reflecting light back into the scintillator material, and wherein the barrier coating is disposed on top portions and interstitially on side portions of the scintillator material;* and

an amorphous silicon array optically coupled to the scintillator;

wherein the x-ray source is capable of projecting a beam of x-rays towards the x-ray detector, the x-ray detector is capable of detecting the x-rays, and an image can be created therefrom.

19. A method for making a scintillator having a single-layer barrier coating thereon that has both protective properties and light reflective and light transmissive properties, the method comprising:

disposing an amorphous silicon array on a detector substrate;

disposing a scintillator material on the amorphous silicon array;

forming a single-layer barrier coating on the scintillator material;

wherein the barrier coating: (1) provides barrier protection to the scintillator material, (2) is capable of transmitting light therethrough, and (3) *is capable of reflecting light back into the scintillator material, and wherein the barrier coating is disposed on top portions and interstitially on side portions of the scintillator material.*

Therefore, Applicant submits that the rejection of Claims 1, 13, 18, and 19 under 35 U.S.C. 103(a) as being unpatentable over Homme et al. has now been traversed and respectfully requests that this rejection be withdrawn. Because Claims 2-12, 14-17, and 20-22 are dependent from Claims 1, 13, and 19, Applicant respectfully requests that the rejection of these claims under 35 U.S.C. 103(a) also be withdrawn.

It should also be noted that Claims 1, 13, 18, and 19 have now been amended to effectively recite spaces (94 in Figure 3) in between the needles (90 in Figure 3), beneath a portion of the protective/reflective coating (92 in Figure 3). See paragraph [0032]. Advantageously, these spaces further enhance the reflection of light and improve overall imaging performance, resulting in sharper images. They are not taught or suggested by Homme et al.

Amended Claims 1, 13, 18, and 19 now recite:

1. A scintillator comprising:

a scintillator material comprising a single-layer barrier coating disposed thereon, wherein the barrier coating: (1) provides barrier protection to the scintillator material, (2) is capable of transmitting light therethrough, and (3) is capable of reflecting light back into the scintillator material, and wherein the barrier coating is disposed on top portions and interstitially on *partial side portions* of the scintillator material.

13. A scintillator comprising a single-layer coating thereon that protects the scintillator from ambient conditions, transmits light therethrough, and reflects light back into the scintillator, wherein the coating is disposed on top portions and interstitially on *partial side portions* of the scintillator.

18. A radiation imaging system comprising:

an x-ray source;

an x-ray detector comprising:

a scintillator comprising:

a scintillator material comprising a single-layer barrier coating disposed thereon, wherein the barrier coating: (1) provides barrier protection to the scintillator material, (2) is capable of transmitting light therethrough, and (3) is capable of reflecting light back into the scintillator material, and wherein the barrier coating is disposed on top

portions and interstitially on *partial side portions* of the scintillator material; and

an amorphous silicon array optically coupled to the scintillator;

wherein the x-ray source is capable of projecting a beam of x-rays towards the x-ray detector, the x-ray detector is capable of detecting the x-rays, and an image can be created therefrom.

19. A method for making a scintillator having a single-layer barrier coating thereon that has both protective properties and light reflective and light transmissive properties, the method comprising:

disposing an amorphous silicon array on a detector substrate;

disposing a scintillator material on the amorphous silicon array;

forming a single-layer barrier coating on the scintillator material;

wherein the barrier coating: (1) provides barrier protection to the scintillator material, (2) is capable of transmitting light therethrough, and (3) is capable of reflecting light back into the scintillator material, and wherein the barrier coating is disposed on top portions and interstitially on *partial side portions* of the scintillator material.

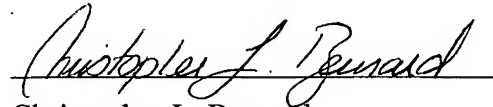
Therefore, Applicant further submits that the rejection of Claims 1, 13, 18, and 19 under 35 U.S.C. 103(a) as being unpatentable over Homme et al. has now been traversed and respectfully requests that this rejection be withdrawn. Because Claims 2-12, 14-17, and 20-22 are dependent from Claims 1, 13, and 19, Applicant respectfully requests that the rejection of these claims under 35 U.S.C. 103(a) also be withdrawn.

CONCLUSION

Applicant would like to thank Examiner for the attention and consideration accorded the present Application. Should Examiner determine that any further action is necessary to place the Application in condition for allowance, Examiner is encouraged to contact undersigned Counsel at the telephone number, facsimile number, address, or email address provided below. It is not believed that any fees for additional claims, extensions of time, or the like are required beyond those that may otherwise be indicated in the documents accompanying this paper. However, if such additional fees are required, Examiner is encouraged to notify undersigned Counsel at Examiner's earliest convenience.

Respectfully submitted,

Date: July 26, 2005



Christopher L. Bernard
Registration No.: 48,234
Attorney for Applicant

DOUGHERTY, CLEMENTS, HOFER, BERNARD & WALKER
1901 Roxborough Road, Suite 300
Charlotte, North Carolina 28211 USA
Telephone: 704.366.6642
Facsimile: 704.366.9744
cbernard@worldpatents.com